

## CLAIMS

I/we claim:

1. A wheel end assembly comprising:

a bearing shaft having an inboard end and an outboard end;

a wheel hub mounted onto said outboard end of said bearing shaft;

a detachable outboard joint mounted onto said inboard end of said bearing shaft; and

a wheel bearing mounted onto said bearing shaft between said inboard end and said outboard end, said wheel bearing including a knuckle flange having an inner diameter that defines an inboard outer race and an outboard outer race, an inboard inner race and an outboard inner race supported on said bearing shaft, and a plurality of bearing elements, a first portion of said bearing elements being positioned between said inboard outer race and said inboard inner race and a second portion of said bearing elements being positioned between said outboard outer race and said outboard inner race; and

an inboard bearing ring, said inboard inner race being formed within said inboard bearing ring, said inboard bearing ring including an engagement portion extending axially inward and engaging said detachable outboard joint;

said inboard end of said bearing shaft including a flange portion, said flange portion providing a support to keep said inboard bearing ring, and said wheel bearing positioned onto said bearing shaft and inducing a pre-load into said wheel bearing such that said pre-load is maintained on said wheel bearing when said outboard joint is removed from said wheel end assembly.

2. The wheel end assembly of claim 1 wherein said outboard inner race is integrally formed within the bearing shaft.

3. The wheel end assembly of claim 1 wherein said wheel hub includes a brake rotor having a braking ring, said braking ring and said brake rotor being integrally formed with one another.

4. The wheel end assembly of claim 1 wherein said wheel hub and said bearing shaft are integrally formed with one another.

5. The wheel end assembly of claim 1 wherein said outboard joint includes a bell housing, said bell housing having a narrowed neck portion defining a bell housing inner surface, said bell housing inner surface having a polygon shape, said engagement portion of said inboard bearing ring presenting an outer surface having a polygon shape corresponding to said polygon shaped bell housing inner surface such that said bell housing engages said inboard bearing ring and rotationally locks said bell housing and said inboard bearing ring to one another.

6. The wheel end assembly of claim 5 wherein said polygonal shaped bell housing inner surface and said polygonal shaped outer surface of said inboard bearing ring are tapered along a longitudinal axis of said wheel end assembly.

7. The wheel end assembly of claim 5 wherein said polygonal shaped bell housing inner surface and said polygonal shaped outer surface of said inboard bearing ring are helical relative to a longitudinal axis of said wheel end assembly.

8. The wheel end assembly of claim 5 wherein a notch extends circumferentially around a portion of said polygon shaped outer surface of said inboard bearing ring, and said bell housing includes at least one window formed within said narrowed neck portion, said wheel end assembly further including a retaining clip inserted through said at least one window and engaging said notch of said bearing shaft to secure said bell housing to said bearing shaft.

9. The wheel end assembly of claim 5 wherein a notch extends circumferentially around a portion of said polygon shaped outer surface of said inboard bearing ring, and a groove extends around said bell housing inner surface, said wheel end assembly further including a retaining ring positioned within said groove within said bell housing, said retaining ring engaging said groove and said notch of said inboard bearing ring to secure said bell housing to said bearing shaft.

10. The wheel end assembly of claim 1 wherein said inboard bearing ring includes a splined inner diameter that engages said bearing shaft such that said inboard bearing ring is rotationally locked onto said bearing shaft.

11. A wheel end assembly comprising:

a bearing shaft having an inboard end and an outboard end;

a wheel hub mounted onto said outboard end of said bearing shaft;

a detachable outboard joint mounted onto said inboard end of said bearing shaft, said outboard joint including a bell housing, said bell housing having a narrowed neck portion defining a bell housing inner surface, said bell housing inner surface having a polygon shape;

a wheel bearing mounted onto said bearing shaft between said inboard end and said outboard end, said wheel bearing including a knuckle flange having an inner diameter that defines an inboard outer race and an outboard outer race, an inboard inner race and an outboard inner race supported on said bearing shaft, and a plurality of bearing elements, a first portion of said bearing elements being positioned between said inboard outer race and said inboard inner race and a second portion of said bearing elements being positioned between said outboard outer race and said outboard inner race; and

an inboard bearing ring, said inboard inner race being formed within said inboard bearing ring, said inboard bearing ring including an engagement portion extending axially inward and engaging said detachable outboard joint, said engagement portion of said inboard bearing ring presenting an outer surface having a polygon shape corresponding to said polygon shaped bell housing inner surface such that said bell housing engages said inboard bearing ring and rotationally locks said bell housing and said inboard bearing ring to one another;

said inboard end of said bearing shaft including a flange portion, said flange portion providing a support to keep said inboard bearing ring, and said wheel bearing

positioned onto said bearing shaft and inducing a pre-load into said wheel bearing such that said pre-load is maintained on said wheel bearing when said outboard joint is removed from said wheel end assembly.

12. The wheel end assembly of claim 11 wherein said outboard inner race is defined by an outer surface of said bearing shaft.

13. The wheel end assembly of claim 11 wherein said wheel hub includes a brake rotor having a braking ring, said braking ring and said brake rotor being integrally formed with one another.

14. The wheel end assembly of claim 11 wherein said wheel hub and said bearing shaft are integrally formed with one another.

15. The wheel end assembly of claim 11 wherein a notch extends circumferentially around a portion of said polygon shaped outer surface of said inboard bearing ring, and said bell housing of said outboard joint includes at least one window formed within said narrowed neck portion, said wheel end assembly further including a retaining clip inserted through said at least one window and engaging said notch of said inboard bearing ring to secure said bell housing to said inboard bearing ring.

16. The wheel end assembly of claim 11 wherein a notch extends circumferentially around a portion of said polygon shaped outer surface of said inboard bearing ring, and a groove extends around said bell housing inner surface, said wheel end assembly further including a retaining ring positioned within said groove within said bell housing, said retaining ring engaging said groove and said notch of said inboard bearing ring to secure said bell housing to said inboard bearing ring.